QUARTERLY REPORT

CONSOLIDATED WATER TREATMENT FACILITY AND OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

FOR APRIL THROUGH JUNE 1996 INCLUDING DATA SUMMARY FOR JANUARY THROUGH MARCH 1996

Rocky Mountain Remediation Services, L L C

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TABLE OF CONTENTS

TABLES

SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

1 0 INTRODUCTION

The Consolidated Water Treatment Facility (CWTF) went on line February 29 1996 The CWTF is designed as a comprehensive facility combining individual IM/IRA treatment activities in order to reduce cost, increase efficiency and offer treatment options to the Rocky Flats Environmental Technology Site (RFETS) in support of on going Environmental Restoration (ER) activities and remediations The following sections summarize the histories of the OU1 and OU2 treatment facilities and the subsequent consolidation of these facilities into the CWTF

1 1 HISTORICAL PERSPECTIVE - OU1

The Operable Unit No 1 (OU1) Water Treatment Facility located in Building 891 began operation in April 1992 Building 891 has historically been used to treat the following waters

- Groundwater collected from the 881 Hillside area (the French Drain Sump and the Collection Well)
- Water collected in the Building 881 Footing Drain (collection and treatment of this water was discontinued in September 1994)
- The majority of the water collected at the Main Decontamination Facility
- Some groundwater well purge water
- Rain water/snow melt pumped from the Building 891 Truck Dock and Tank Farm

Water from the French Drain Sump is piped directly to one of the Building 891 influent storage tanks each operating day The depth of water level in the French Drain Sump typically regenerates from about a 1-foot low (after pumping) to 4-6 feet (over a one day period) The water from the Collection Well is pumped into a trailer-mounted container each operating day, and the container is then transported to Building 891 for off-loading and treatment.

The water from the French Drain Sump and from the Collection Well is temporarily stored in one of two influent collection tanks prior to treatment. The water is then treated with an ultraviolet (UV) light/hydrogen peroxide system for the removal of volatile organic compounds (VOCs) and a four-step ion exchange (IX) system for the removal of uranium total dissolved solids hardness alkalinity anions, and selected metals

After treatment, the water is stored in one of three effluent storage tanks until laboratory sample results are received to verify that the water chemistry meets OU1 Applicable or Relevant and Appropriate Requirements (ARARs) and is acceptable for discharge into the South Interceptor Ditch (SID)

1 2 HISTORICAL PERSPECTIVE - OU2

The Operable Unit No 2 (OU2) Field Treatability Unit (FTU) Granular Activated Carbon Treatment Units (located in trailer T 900C) began operation in May 1991 and the Radionuclides Removal System (located in trailers T 900A and T 900B) began operation in April 1992 The FTU was historically used to treat the following waters

- Surface water collected from Surface Water Stations SW-59, SW-61, and SW 132 (collection and treatment of water from SW-61 and SW 132 was discontinued on May 6 1994)
- Some of the water collected at the Main Decontamination Facility
- Some groundwater well purge water
- Rainwater collected from FTU trailer containments
- Soil Vapor Extraction condensate water

Collected surface water was pumped directly from the surface water stations to Equalization Tank T 200 via a heat traced pipeline However in May 1995 because heavy rains interrupted power at the SW-59 weir and may have compromised the integrity of the pipeline it became necessary to collect and transport water from SW 59 to T 200 using a trailer mounted container The use of the container for collection and transport will be discontinued as soon as construction of the double walled storage tank adjacent to SW 59 is complete (anticipate end of September 96)

Collected surface water was stored in Equalization Tank T 200 until enough water was present to justify initiating a batch treatment. The water was then treated using pH adjustment, chemical precipitation and cross flow membrane filtration for the removal of radionuclides and metals, and GAC for the removal of VOCs No effluent holding tank existed at OU2, and therefore treated effluent from the FTU was discharged directly to South Walnut Creek as it was processed The last process run for the OU2 FTU trailers at the OU2 location was August 8, 1995 and the final reading on the OU2 FTU totalizer was 24 856 900 gallons of water treated

1 3 CONSOLIDATED WATER TREATMENT FACILITY

The Consolidated Water Treatment Facility (CWTF) consists of the following specific unit operations.

Chemical precipitation (T-900A/T 900B)
Cross-flow membrane microfiltration (T-900A/T-900B)
Ultraviolet Light/Hydrogen Peroxide Oxidation (Building 891)
Granular Activated Carbon (Building 891)[1]
Ion Exchange (Building 891)

A portable clay absorbent media drum is also available for use at the CWTF during water transfers from tanker trucks to CWTF influent storage tanks as a pretreatment of oily wastewaters

Highlights of the construction and subsequent operation of the CWTF are as follows

August 18, 1995. The OU2 trailers T 900A and T-900B were relocated to the south side of Building 891 (the T-900C GAC trailer was not relocated)
September 18 1995 The first day that OU2 SW-059 water which is transported to the CWTF via trailer-mounted container, was treated in Building 891
October 17 1995 The OU2 Equalization Tank T-200 was relocated to the southeast corner of Building 891
February 7, 1996 Acceptance at the CWTF of water from the emptying and cleaning of Tanks T-2 and T-40 (an ER Accelerated Action Project)
February 27, 1996. Installation of the Granular Activated Carbon Unit in Building 891 complete.
February 29, 1996 Treatment of Tank T-2 and Tank T-40 water through the OU2 trailers chemical precipitation/microfiltration system.
May 20, 1996 Acceptance of Ryan s Pit thermal desorption water for treatment and first use of the oil absorbent media drum.
May 28 1996 Installation of new vent on Acid Tank T-209 complete
June 17, 1996. Acceptance of Trench T-3/T-4 thermal desorption water for treatment.
June 26 1996 First use of T 200 as a storage tank since its relocation from OU2

The CWTF currently treats contaminated water from the following sources

OU1 groundwater and OU2 surface water
Decontamination water from the Main and Protected Area Decontamination Facilities
Other ER waters (e g purge water water pumped from containments, etc)
Waters from ER Accelerated Action Projects

The CWTF flowpath is flexible enough to allow waters to be treated through particular unit processes as necessary and to allow for re-treatment if necessary The consolidation of the OU1 and OU2 water treatment facilities has reduced waste generation and significantly reduced direct operating costs

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[1]It was anticipated that the Consolidated Water Treatment Facility would also include cartridge filtration however this project was canceled due to budget cuts

2 0 CWTF OPERATIONS (APRIL, MAY, JUNE 1996)

2 1 QUANTITIES OF WATER COLLECTED AND TREATED

Table 2 1 summarizes the quantities of water treated at the CWTF for the period April through June 1996 During this period the CWTF accepted water from the following sources

OU1 French Drain Sump
OU1 Collection Well
OU2 Surface Water Station SW 59
Snow melt/rain water pumped from CWTF containments
Water from the MDF and PADF
Ground water purge water
Water from the emptying and cleaning of Tanks T 2 and T-40
Water from the thermal desorption of soil from Ryan s Pit.
Water from the thermal desorption of soil from Trench T-3/T-4

As can be seen from Table 2 1 a total of approximately 189 281 gallons of water were treated through the Building 891 Ion Exchange Columns during the April through June period. Approximately 76 491 gallons of the total 189 281 gallons were treated through the Building 891 GAC Unit, and approximately 38,352 gallons of the total water volume were treated through the chemical precipitation/microfiltration trailers

Please note that because the CWTF is equipped with three Influent Tanks the amount of water treated may be less than or greater than the amount of water collected for any given period.

One CWTF Effluent Storage Tank was released to the SID during the April through June 1996 period (refer to Table 3-4 for a listing of the most recent discharges from CWTF Effluent Storage Tanks)

As of the end of June 1996 approximately 3 438 988 gallons of water has been processed through the Building 891 Ion Exchange Columns

2 2 CHEMICAL USAGE

The following chemicals are utilized during wastewater treatment operations at the CWTF

Building 891
- Hydrogen peroxide (UV oxidation)
- Hydrochloric acid (ion exchange regeneration and pH adjustment)
- Sodium hydroxide (ion exchange regeneration)

T 900A/T 900B trailers
- Sulfuric acid (pH adjustment. TK 1 and effluent, filter module chemical cleaning)
- Calcium hydroxide (precipitation)
- Ferric sulfate (precipitation)
- Hydrogen peroxide (chemical cleaning of filter modules)
- Sodium hydroxide (pH adjustment. TK 2)
- Sodium hypochlorite (chemical cleaning of filter modules)

Table 2 2 summarizes the quantities of chemicals utilized during the period of January through March 1996

TABLE 2-1
CONSOLIDATED WATER TREATMENT FACILITY
APPROXIMATE QUANTITIES OF WATER COLLECTED AND PROCESSED a/

Month/Year	Gallons Collected from the OU1 French Drain Sump b/	Gallons Collected from the OU1 Collection Well b/	Gallons Accepted at Bldg 891 from the MDF and Other Sources c/	Gallons Pumped from Bldg. 891 Containments	Gallons Collected from the OU2 SW-59 d/	Gallons Processed through T900A/T900B e/	Gallons Processed through GAC at Bldg 891	Gallons Processed through IX at Bldg 891
Jan-96	20 590	1 400	4 500 f/	2 421	5 840	0	0	36 925
Feb-96	21 224	1 420	8203 g/ 528 h/	500	5 765	8 220	0	27,363
Mar 96	31,864	1 730	3,321 g/	8,046	5,680	0	12 418	45,598
1st Quarter Totals	73,678	4 550	16,552	10,967	17,285	8,220	12,418	109,886
Apr 96	36,924	2,035	5 200 i/ 7 596 g/	4,612	5,940	7 700	7 770	73 000
May 96	23 184	1 710	2535 i/ 650 g/ 6,973 j/	16,360	6 620	8 867	41 467	61 557
Jun-96	11 592	1 435	8,218 i/ 22,331 k/	2,695	6,215	21 785	27 254	54 724
2nd Quarter Totals	71,700	5,180	53,503	23,667	18,775	38,352	76 491	189,281
Year to-Date Totals	145,378	9,730	70,055	34,624	36,060	46,572	88,909	299,167

a/ Please note that because the CWTF is equipped with Influent Tanks the quantity of water collected will not necessarily equate to the quantity of water processed
b/ This ground water is collected each operating day (i e 5 days per week)
c/ Other sources may include purge water, ER Accelerated Action Project water etc.
d/ This surface water is collected daily (i e 7 days per week)
e/ The OU2 FTU trailers T 900A/T 900B were operated at the CWTF for the first time on February 29, 1996
f/ This water was potable water which was used during the tightness testing of CWTF Influent Tank T-200
g/ This water was from the emptying and cleaning of Tank T-2/Tank T-40(an ER Accelerated Action Project)
h/ This water was potable water used for OU2 trailer start up/testing
i/ This water was ground water purge water
j/ This water was thermal desorption water from Ryan s Pit (an ER Accelerated Action Project)
k/ This water was thermal desorption water from Trench T 3 and Trench T-4 (an ER Accelerated Action Project)

TABLE 2-2
CONSOLIDATED WATER TREATMENT FACILITY
CHEMICAL USAGE

	Building 891			T-900A/T-900B					
Month/Year	Hydrochloric Acid 36% (gallons)	Sodium Hydroxide 50% (gallons)	Hydrogen Peroxide 50% (gallons)	Sulfuric Acid a/ 98% (gallons)	Calcium Hydroxide (pounds)	Ferric Sulfate (pounds)	Hydrogen Peroxide 35% (gallons)	Sodium Hydroxide 50% (gallons)	Sodium Hypochlorite (gallons)
Jan 96	0 0	16 0	4 1	0 0	0 0	50 0	0 0	0 0	0 0
Feb 96	0 0	54 0	5 1	16 6	9 9	13 5	0 0	5 0	0 0
Mar 96	95 0	60 0	3 7	0 0	0 0	0 0	10 0	0 0	0 0
1st Quarter Totals	95 0	130 0	12 9	16 6	9 9	63 5	10 0	5 0	0 0
Apr 96	204 4	123 4	4 6	0 4	12 0	0 5	15 0	2 5	0 0
May 96	259 8	101 6	4 5	1 0	11 3	6 5	0 0	2 0	0 0
Jun 96	131 9	122 6	2 3	12 0	53 8	13 9	44 9	4 8	0 0
2nd Quarter Totals	596 1	347 6	11 4	13 4	77 1	20 9	59 9	9 3	0 0
Year to Date Totals	691 1	477 6	24 3	30 0	87 0	84 4	69 9	14 3	0 0

a/ In additon to the sulfunc acid quantity listed in this column occasionally a small amount (approximately 1 gallon per effluent tank) of sulfunc acid is used in Building 891 for effluent pH adjustment

2 3 WASTE GENERATION

The following types of waste are generated during normal wastewater treatment operations at Building 891 and the T 900A/T-900B trailers.

Building 891
- used filter socks
- neutralized ion exchange regenerant
- personnel protective equipment

T 900A/T-900B trailers
- filter press sludge cake
- personnel protective equipment
- used filter membranes

Table 2-3 summarizes the types and quantities of the waste generated during wastewater treatment operations at Building 891 and the T-900A/T-900B trailers for the first quarter of 1996. Approximately 16,357 gallons of neutralized regenerant water from Tank T-210 was sent to the 374 evaporator for processing during the April through June 1996 period.

TABLE 2-3
CONSOLIDATED WATER TREATMENT FACILITY
WASTE GENERATION

	Building 891			T 900A/T 900B		Bldg 891/T 900A/T 900B
Month/Year	Filter Socks (55 gal drum)	Neutralized Regenerant to 374 (gallons)	Spent GAC (pounds) a/	Sludge Production (55 gal drum)	Used Filter Membranes (55-gal drum)	Personal Protective Equip (55 gal drum) b/
Jan 96		0	0	0	0	
Feb 96		0	0	0	0	
Mar 96		4 211	0	0	0	
1st Quarter Totals	0 d/	4 211	0	0	0	2 drums c/ d/
Apr 96		9 326	0	0	0	
May 96		2 670	0	0	0	
Jun 96		4 361	0	0	0	
2nd Quarter Totals	0 d/	16,357	0	0	0	2 drums c/ d/
Year to Date Totals	0	20,568	0	0	0	4

a/ A Granular Activated Carbon unit was installed in Building 891 in February 1996

b/ PPE is monitored for radiological contaminants and if determined to be acceptable for unrestricted release is sent to the Rocky Flats landfill for disposal Until the acceptance water from an ER Accelerated Action Project in February 1996 no PPE from Building 891 or the T 900A/T 900B trailers had been found to be radiologically contaminated

c/ PPE is collected from water treatment operations MDF decontamination operations etc and is drummed collectively

d/ These drums are filled gradually and therefore only quarterly totals are reported

3 0 INFLUENT AND EFFLUENT SAMPLING (JANUARY, FEBRUARY, MARCH 1996)

3 1 881 HILLSIDE GROUNDWATER CHARACTERISTICS

The 1992 French Drain Performance Monitoring Plan (FDPMP) requires monitoring of French Drain performance The FDPMP requires groundwater level measurements of designated French Drain monitoring wells 4787 4887 10092 10192 10292 10392 10492 10592 10692 10792 10892 10992, 11092 31491 35691 39991 45391[2] Additionally quarterly sampling of the wells is required

Well # s 4787 10192 10392 and 45391 were reported as dry during the January 1996 sampling/water level monitoring and not all wells are sampled for all parameters due to the small quantities of water generated at many of the locations Also as noted in previous quarterly reports 16 wells were removed from the site monitoring program at the beginning of the 1996 fiscal year

Table 3 1 presents a synopsis of the selected ground water monitoring well data for the following categories of constituents

VOCs
Radionuclides
Metals
Water Quality

All constituents which exceeded OU1 ARARs are included in Table 3 1 however compounds which did not exceed OU1 ARARs are not necessarily included in the table Note that it has historically been assumed that the OU1 ARARs for radionuclides and metals are dissolved values

As can be seen from Table 3 1 during the January February March 1996 period those constituents which did exceed OU1 ARARs include the following

GROUND WATER WELLS

Compound	Exceedance Range	Units	OU1 ARAR
Selenium	34 9 to 789	ug/L	10

Note that Naphthalene was detected in Well # 10692 at 2 ug/L and that chloroform was detected in Well # 10992 at an estimated value of 0 1 ug/L however neither of these compounds have associated OU1 ARARs Tetrachloroethane and toluene were detected in Well # 10792 at estimated values of 0 6 ug/L and 0 5 ug/L respectively however both of these estimated concentrations are below the OU1 ARARs

Due to the re prioritization of site resources a water level map of the OU1 881 Hillside for the April through June 1996 period is not available

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[2] Well #39991 was reported as damaged in April 1993 and has been abandoned

TABLE 3-1
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED GROUND WATER WELL CONSTITUENTS TO OU1 ARARS
JANUARY, FEBRUARY, MARCH 1996

			GROUND WATER WELLS					
			WELL 10092	WELL 10492	WELL 10592	WELL 10692	WELL 10792	WELL 10992
	OU1		Alluvial	Bedrock	Alluvial	Alluvial	Bedrock	Alluvial
COMPOUND	ARAR	UNITS	16 Jan 96	6-Feb-96	6-Feb 96	7 Feb-96	17 Jan 96	17 Jan 96
1 1,1 Trichloroethane	200	ug/L	1 0 U a/	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
1,1,2 Trichloroethane	5	ug/L	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
1,1 Dichloroethane	5	ug/L	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
1,1 Dichloroethene	7	ug/L	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
1,2 Dichloroethane	5	ug/L	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Acetone	50	ug/L	b/					--
Bromoform	NA c/	ug/L	1 0 U	1.0 U	1 0 U	1 0 U	1 0 U	1 0 U
Carbon Disulfide	5	ug/L	-		--		-	
Carbon Tetrachloride	5	ug/L	1.0 U	1 0 U	1 0 U	1 0 U	1 0 U	1.0 U
Chloroform	NA	ug/L	1 0 U	1 0 U	1 0 U	1.0 U	1 0 U	0 1 J
Methylene Chloride	5	ug/L	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Napthalene	NA	ug/L	1 0 U	1 0 U	1 0 U	2	1 0 U	1 0 U
Tetrachloroethene	5	ug/L	1 0 U	1 0 U	1 0 U	1 0 U	0 6 J	1 0 U
Toluene	2000	ug/L	1 0 U	1 0 U	1.0 U	1 0 U	0 5 J	1 0 U
Trichloroethene	5	ug/L	1.0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
Trichlorofluoromethane	NA	ug/L	1.0 U	1 0 U	1 0 U	1 0 U	1 0 U	1 0 U
				Dissolved	Dissolved	Dissolved		Dissolved
Gross Alpha d/	15	pCi/L	-	12 06	6.009	8 495		9 418
Gross Beta	50	pCi/L	-	9.36	7.077	9 345	-	7 399
Uranium	40	pCi/L	-	27.01	23 80	26 17	-	11 53
Copper (dissolved)	200	ug/L		--		-	--	
Iron (dissolved)	300	ug/L		-	--		-	
Lead (dissolved)	50	ug/L	-	-		-		
Selenium (dissolved)	10	ug/L		[illegible]	[illegible]	[illegible]		
Thallium (dissolved)	10	ug/L		-	--	-		
Nitrate/Nitrite	10	mg/L						
Sulfate	250	mg/L		-				
Total Dissolved Solids	400	mg/L						

a/ Refer to Appendix A for an explanation of the data qualifiers
b/ " = Data not available
c/ NA = No ARAR exists for this constituent
d/ Note that this table does not include the error bounds on the radiological data

3 2 OU1 FRENCH DRAIN SUMP, COLLECTION WELL, AND BUILDING 881 FOOTING DRAIN CHARACTERISTICS

Collection Well water is now collected separately from the French Drain Sump water and collection and treatment of water from the Building 881 Footing Drain was discontinued in September 1994 Therefore the current French Drain Sump data is representative of only those waters that seep from the groundwater table into the French Drain For the January February March 1996 period, quarterly sampling was performed at the French Drain Sump the Collection Well and the Building 881 Footing Drain

Table 3 2 presents a synopsis of selected French Drain Sump Collection Well and Building 881 Footing Drain data for the following categories of constituents

VOCs
Radionuclides
Metals
Water Quality

All constituents which exceeded OU1 ARARs are included in Table 3 2 however compounds which did not exceed OU1 ARARs are not necessarily included in the table Note that it has historically been assumed that the OU1 ARARs for radionuclides and metals are dissolved values

As can be seen in Table 3 2 samples taken from the French Drain Sump during the January through March 1996 period did not exceed OU1 VOC or radionuclide ARARs Those constituents which did exceed OU1 ARARs include the following

FRENCH DRAIN SUMP

Compound	Exceedance Range	Units	OU1 ARAR
Selenium (dissolved)	28 8	ug/L	10
Total Dissolved Solids	620	mg/L	400

Table 3 2 also presents a synopsis of Collection Well data for the January through March 1996 period. As can be seen in Table 3 2 samples taken from the Collection Well continue to contain elevated levels of VOCs Those constituents which did exceed OU1 ARARs include the following

COLLECTION WELL

Compound	Exceedance Range	Units	OU1 ARAR
1 1 Dichloroethene	21	ug/L	7
Carbon Tetrachloride	20	ug/L	5
Tetrachloroethene	76	ug/L	5
Trichloroethene	580	ug/L	5
Gross Alpha	17 72	pCi/L	15
Selenium	830	ug/L	10
Total Dissolved Solids	1149	mg/L	400

1 1 1 Trichloroethane was detected at 7 ug/L however this concentration is well below the OU1 ARAR of 200 ug/L Chloroform was also identified during Collection Well sampling however this compound does not have an associated OU1 ARAR

As can be seen in Table 3 2, samples taken from the Building 881 Footing Drain collected during the January through March 1996 period exceeded OU1 ARARs as follows

BUILDING 881 FOOTING DRAIN

Compound	Exceedance Range	Units	OU1 ARAR
Tetrachloroethene	28	ug/L	5
Total Dissolved Solids	544	mg/L	400

Note that the Building 881 Footing Drain is currently being sampled for both total and dissolved radionuclides and metals (refer to DOE letter ER.SRG-10199 dated September 29, 1994)

TABLE 3 2
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED OU1 INFLUENT SOURCE CONSTITUENTS TO OU1 ARARS
JANUARY FEBRUARY MARCH 1996

COMPOUND	OU1 ARAR	UNITS	FRENCH DRAIN SUMP 9 Jan 96	COLLECTION WELL 9 Jan 96	BLDG 881 FOOTING DRAIN 9 Jan 96	
1 1 1 Trichloroethane	200	ug/L	1 U a/	7	2 U	
1 1 2 Trichlorethane	5	ug/L	1 U	1 U	2 U	
1 1 Dichloroethane	5	ug/L	1 U	1 U	2 U	
1 1 Dichloroethene	7	ug/L	1 U	21	1 J	
1 2 Dichloroethane	5	ug/L	1 U	1 U	2 U	
Acetone	50	ug/L	4 BJ	5 U		
Benzene	NA b/	ug/L	1 U	1 U	2 U	
Carbon Disulfide	5	ug/L	1 U	1 U	-	
Carbon Tetrachloride	5	ug/L	1 U	20	2 U	
Chloroform	NA	ug/L	1 U	1	2 U	
Methylene Chloride	5	ug/L	2 U	2 U	5 U	
Napthalene	NA	ug/L	- c/		1 BJ	
Tetrachloroethene	5	ug/L	0 4 J	76	28	
Toluene	2000	ug/L	1 U	1 U	2 U	
Trichloroethene	5	ug/L	1 U	560 D	9	
Trichlorofluoromethane	NA	ug/L	U	--	2 U	
1 1 2 Trichlorotrifluoroethane	NA	ug/L	-	4 JN	-	
			Dissolved	**Dissolved**	**Total**	**Dissolved**
Gross Alpha d/	15	pCi/L	10 05	17 72	8	7
Gross Beta	50	pCi/L	5 457	8 215	8	7
Uranium	40	pCi/L	11 036	19 504	7 727 J	8 332 J
Aluminum	200	ug/L	71 4 B	54 4 B	43 2 B	50 0 B
Cadmium	10	ug/L	3 4 U	3 4 U	3 4 U	3 4 U
Calcium	NS	ug/L	98600	168000	98700	102000
Copper	200	ug/L	17 8 B	14 7 B	14 6 B	18 1 B
Iron	300	ug/L	190	46 3 B	73 4 B	63 2 B
Lead	50	ug/L	1 7 U	1 7 U	1 7 U	1 7 U
Magnesium	NS	ug/L	29400	37900	23200	24100
Manganese	50	ug/L	6 9 B	7 4 B	8 1 B	8 2 B
Selenium	10	ug/L	25 6	680	7 7	8 5
Zinc	2000	ug/L	45 8	18 6 B	92 0	83 0
Hardness (as CaCO3 Ca and Mg)	NA	mg/L	367	575		354
Chloride	250	mg/L	89 0	189	94 4	
Nitrite/Nitrate	10	mg/L	1 63	6 19	7 89	
Sulfate	250	mg/L	90 4	229	43 0	
Total Dissolved Solids	400	mg/L	520	1149	544	

a/ Refer to Appendix A for an explanation of the data qualifiers
b/ NA = No ARAR exists for this constituent
c/ = Data not available
d/ Note that this table does not include the error bound on the radiological data

3.3 OU2 SURFACE WATER CHARACTERISTICS

Surface water is sampled on a quarterly basis from SW-59 SW-61 and SW-132. Although the Environmental Protection Agency and the Colorado Department of Public Health and the Environment authorized the discontinuation of the collection and treatment of SW-61 and SW-132 on April 24, 1994 the two surface water stations continue to be sampled to verify that no increase in contamination is occurring Collection and treatment for SW-61 and SW-132 was discontinued on May 6 1994 Presently only SW-59 water is collected and treated. Note that it has historically been assumed that the OU2 ARARs for radionuclides and metals are total values

Table 3-3 presents a synopsis of OU2 Surface Water data for the October through December 1995 period. As can be seen in Table 3-3 those constituents which did exceed OU2 ARARs include the following

SURFACE WATER STATIONS SW-59, SW-61, and SW-132

Compound	Stations	Exceedance Range	Units	OU2 ARAR
Carbon Tetrachloride	SW-59, SW-61	42E to 10	ug/L	5
Chloroform	SW-59, SW-61	12 to 4	ug/L	1
Tetrachloroethene	SW-59 SW-61 SW-132	110E to 3	ug/L	1
Trichloroethene	SW-59, SW-61	160E to 19	ug/L	5
Vinyl Chloride	SW-61	5	ug/L	2
Americium	SW-59, SW-132	0 139 to 0 071	pCi/L	0 05
Uranium (total)	SW-59	10.591	pCi/L	10
Aluminum (total)	SW-59, SW-61 SW-132	218 to 2780	ug/L	200
Iron (total)	SW-132	3460	ug/L	1000
Zinc (total)	SW-59, SW-61 SW-132	113 to 228	ug/L	50

Other compounds, such as 1,1,1-Trichloroethane and cis-1 2-Dichloroethene were also identified during the sampling, however these constituents do not have OU2 ARARs

TABLE 3 3
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED SW 59, SW-61 AND SW 132 CONSTITUENTS TO OU2 ARARS
JANUARY FEBRUARY MARCH 1996

COMPOUND	OU2 ARARs	Units	SW 59 a/		SW 61 a/		SW 132
			7 Feb 96	29 Mar 96	7 Feb 96	29 Mar 96	7 Feb 96
1 1 1 Trichloroethane	NA b/	ug/L	75 E c/	5 U	34	1	1 0 U
1 1 Dichloroethane	NA	ug/L	1 0 U	5 U	1 0 U	2	1 0 U
1 1 Dichloroethene	7	ug/L	3	5 U	1	1 0 U	1 0 U
1,2 Dichloroethane	NA	ug/L	1 0 U	5 U	1 0 U	1 0 U	1 0 U
Carbon Tetrachloride	5	ug/L	42 E	25	10	3	1 0 U
Chloroform	1	ug/L	12	10	4	1 0 U	1
Methylene Chloride	NA	ug/L	1 0 U	5 U	1 0 U	1 0 U	1 0 U
Tetrachloroethene	1	ug/L	70 E	21	110 E	3	3
Trichloroethene	5	ug/L	180 E	19	97 E	4	1 0 U
Vinyl Chloride	2	ug/L	1 0 U	5 U d/	1	5	1 0 U
cis 1 2 Dichloroethene	NA	ug/L	4	12	4	22	2
Americium e/	0 05	pCi/L	Total 0 138	- f/	Total 0 015		Total 0 071
Gross Alpha	11	pCi/L	9	-	4		10
Gross Beta	19	pCi/L	4	-	6		17
Plutonium 239/240	0 05	pCi/L	0 042		0 012		0 034
Uranium	10	pCi/L	10 591		3 967		1 737
Aluminum	200	ug/L	215	--	221		2780
Copper	25	ug/L	6 0 B	-	6 3 B		14 1 B
Iron (dissolved)	300	ug/L	-	-	-		-
Iron	1000	ug/L	250	-	304		3460
Lead	5	ug/L	10 0 U d/	-	10 0 U d/		10 0 U d/
Manganese	1000	ug/L	151		38 2	-	99 7
Manganese (dissolved)	50	ug/L	--		-		--
Selenium	10	ug/L	1 0 UW		1 0 UW	-	1 0 U
Zinc	50	ug/L	113		160	-	228
Total Dissolved Solids (TDS)	NS	mg/L	-	-			
Chloride	NS	mg/L					
Sulfate	NS	mg/L	-				
Hardness (as CaCO3 Ca and Mg)	NA	mg/L	447		226		102

a/ Because of the high VOA concentrations detected in the 2 7 96 sample another VOA sample was taken on 3 29 96
b/ NA = No ARAR exists for this constituent
c/ Refer to Appendix A for an explanation of the data qualifiers
d/ Note that this table does not include the error bounds on the radiological data
e/ = *Data not available or not sampled*
f/ Although this data is non detect the detection limit is higher than the OU2 ARAR

3 4 TREATED EFFLUENT CHARACTERISTICS

Treated effluent from the CWTF is stored in one of three Effluent Storage Tanks prior to discharge An Effluent Storage Tank is sampled once it is full, and the tank is discharged if the data show that ARARs have not been exceeded. Table 3-4 presents a synopsis of selected effluent tank data for April through June 1996 (Note that not all analyzed compounds are presented on Table 3-4)

The Effluent Storage Tank discharged in January 1996 contained treated water from OU1 and OU2 influent sources, purge water MDF water and snow melt pumped from CWTF containments. Because the treated water originated from both OU1 and OU2 sources, the data for the treated effluent tank were compared to the most stringent of the OU1 and OU2 ARARs It was determined that the concentration of zinc in the treated effluent exceeded the OU2 ARAR of 50 ug/L However because the zinc concentration was below the proposed RFCA Segment 5 standard of 141 00 ug/L, the Colorado Department of Public Health and Environment granted approval for the release of the effluent tank (refer to DOE letter 96-DOE-09486, dated April 5 1996)

The last column of Table 3-4 also presents a list of the proposed RFCA Segment 5 Standards for analytes which are parallel to the OU1/OU2 ARARs This column has been included to show that difficulties will develop when the RFCA list is actually implemented. The following is a list of general concerns:

Under RFCA the metals standards are a mixture of dissolved, total, and total recoverable standards which will increase the sampling and analysis cost for compliance points

Some of the RFCA metal standard concentrations may not be practically achievable, as shown by the boxed constituents in the last column of Table 3-4 For instance, the RFCA Segment 5 standard for cadmium is 1.5 ug/L (dissolved), however under the General Radiochemistry and Routine Analytical Services Protocol (GRRASP) laboratories have a Contract Required Detection Limits (CRDL) for cadmium of 5 ug/L (see also antimony, mercury, and silver)

TABLE 3-4
CONSOLIDATED WATER TREATMENT FACILITY
COMPARISON OF SELECTED EFFLUENT STORAGE TANK DATA TO OU1/OU2 ARARS
APRIL, MAY JUNE 1996

				CWTF Effluent Tanks		
				Tank No T 205		RFCA Segment 5
	OU1	OU2		Sampled 2/7/96 2/26/96 a/ b/		Analytes Parallel
COMPOUND	ARARs	ARARs	UNITS	Discharged 4/18/96		to OU1/OU2
VOLATILES						
1,1,1 Trichloroethane	200	NS c/	ug/L	1 0 U d/		200 00
1,1,2 Trichloroethane	5	NS	ug/L	1 0 U		5 00
1,1 Dichloroethane	5	NS	ug/L	1 0 U		1010 00
1,1-Dichloroethene	7	7	ug/L	1 0 U		7 00
1,2 Dichloroethane	5	NS	ug/L	1 0 U		5 00
Acetone	50	NS	ug/L	5 U		3650 00
Carbon disulfide	5	NS	ug/L	1 0 U		27 60
Carbon tetrachloride	5	5	ug/L	1 0 U		5 00
Chloroform	NA	1	ug/L	1 0 U		6 00
Methylene chloride	5	NS	ug/L	1 0 U		5 00
Tetrachloroethene	5	1	ug/L	1 0 U		5 00
Toluene	2000	NS	ug/L	1 0 U		1000 00
Trichloroethene (TCE)	5	5	ug/L	1 0 U		5 00
Vinyl chloride	NA	2	ug/L	1 0 U		2 00
RADIONUCLIDES e/				**Total**		Woman Creek
Americium 241	4	0 05	pCi/L	0 001697 J		0 15 T
Gross Alpha	15	11	pCi/L	0 1337 J		7 00 T
Gross Beta	50	19	pCi/L	0 5477 J		8 00 T
Plutonium 238/239/240	15	0 05	pCi/L	0 000859 J		0 15 T
Radium 226 and 228	NS	NS	pCi/L	-- f/		5 00 T
Strontium 89/90	8	NS	pCi/L	0 0766 J		8 00 T
Tritium	20000	NS	pCi/L	58 31 J		500 00
Uranium	40	10	pCi/L	0 03431 J		11 00 T
METALS g/				**Total**	**Dissolved**	Segment 5
Aluminum	5000	200	ug/L	34 0 U	28 3 B	87 00 D
Antimony	60	NS	ug/L	18 0 U	31 7 B	6 00 TR h/
Arsenic	50	50	ug/L	2 0 U	4 6 U	50 00 TR
Barium	1000	1000	ug/L	43 7 B	48 9 B	1000 00 TR
Beryllium	100	100	ug/L	1 0 U	0 92 B	4 00 TR
Boron	NS	NS	ug/L	--	--	750 00 T
Cadmium	10	10	ug/L	3 0 U	3 4 U	1 50 D
Chromium (total)	NS	NS	ug/L	4 0 U	4 4 U	NS
Chromium III	50	10	ug/L	--	--	50 00 TR
Chromium VI	50	10	ug/L	--	--	11 00 D
Copper	200	25	ug/L	3 0 U	22 1 B	16 00 D
Iron (dissolved)	300	300	ug/L	--	49 0 B	NS
Iron (total)	1000	1000	ug/L	21 0 B	--	1000 00 TR
Lead	50	5	ug/L	1 0 UMN	1 7 U	6500 00 D
Magnesium	NS	NS	ug/L	531 B	1090	NS
Manganese (dissolved)	50	50	ug/L	--	4 4 B	NS
Manganese (total)	NS	1000	ug/L	1 0 U	--	1000 00 TR
Mercury	2	0 2	ug/L	0 20 U	0 10 U	0 01 T
Nickel	200	40	ug/L	20 0 U	16 1 U	123 00 D
Selenium	10	10	ug/L	1 0 U	4 5 U	5 00 D
Silver	50	NS	ug/L	2 0 U	5 0 U	0 60 D
Zinc	2000	50	ug/L	24 3	52 0 f/	141 00 D
WATER QUALITY						Segment 5
Hardness (as CaCO3 Ca and Mg	NS	NS	mg/L	6 4		NS
Chloride	250	NS	mg/L	4 61		NS
Fluoride	NS	NS	mg/L	0 24		2 00
Nitrate + Nitrite	NS	NS	mg/L	0 304		NS
Nitrate	10	NS	mg/L	--		10 00
Nitrite	1	NS	mg/L	--		4 50
Sulfate	250	NS	mg/L	19 3		NS
Sulfide (as H2S)	NS	NS	mg/L	--		0 002
Total Dissolved Solids (TDS)	400	NS	mg/L	40 0		NS
pH	6 5 9 0	NS	SU	7 33		6 5 9 0
Dissolved Oxygen (minimum)	NS	NS	mg/L	--		5 0

a/ Two samples were taken of this effluent tank FT10460RG for VOCs and Total Metals and FT10462RG for Dissolved Metals Radionuclides and Water Quality

b/ Data presented in this table is taken both from RFEDs and from faxes sent by the laboratories

c/ NS = No Standard

d/ Refer to Appendix A for an explanation of the data qualifiers

e/ -- = This data is not available

f/ Note that this table does not include the error bounds on the radiological data

g/ Historically it has been assumed that OU1 radionuclide and metal ARARs were dissolved concentrations and that OU2 radionuclide and metal ARARs were total concentrations

h/ Particular RFCA Standards have been highlighted because the concentration of the RFCA Standard is either less than the GRRASP contractual level or is not achievable from a practical standpoint

i/ This effluent tank was released after approval from CDPHE (refer to DOE letter 96-DOE-09486 dated April 5 1996)

4 0 ENVIRONMENTAL COMPLIANCE

Periods of Non Collection, OU2 SW 59

There were three periods of non collection at the OU2 SW 59 weir during the April May June 1996 period These three periods are as follows

On April 19 1996 it was discovered that power to the SW 59 weir was down A generator was immediately used to restore power Approximately 40 gallons was not collected

On April 25 1996 it was discovered that the plant grid supplying power to the SW 59 weir was down A generator was immediately used to restore power Approximately 35 gallons was not collected

On May 24 1996 it was discovered that a portable generator being used to supply temporary power to OU2 SW 59 was not operating The generator was immediately restarted. Approximately 35 gallons was not collected

Other Events

On April 12, 1996 it was noticed that a discharge valve on Tanker Truck #10 which contained water from the thermal desorption of Trench T 2 soils was dripping The thermal desorption water was immediately transferred to Tanker Truck #8 and affected soil was removed.

On June 13 1996 it was noticed that the overflow tube on Tanker Truck #10 was dripping At the time the drip was discovered the tanker truck was parked in the Building 891 truck dock and was filled with thermal desorption water from Trench T-3/T-4 Such a small amount of water had dripped that clean up was not practical It was decided that the level to which Tanker Truck #10 would be filled with thermal desorption water would be limited.

5 0 ANTICIPATED OPERATIONS FOR NEXT QUARTER

Collection and treatment of water from the French Drain Sump will continue as normal Water from the Collection Well will continue to be collected in the OU1 trailer mounted container and transported to the CWTF for off loading and treatment. Purge incidental and decontamination pad waters will continue to be accepted and treated.

Collection and transport of SW 59 water to the CWTF will continue via the OU2 trailer mounted container until construction of the above-ground storage tank adjacent to SW 59 is complete after which SW 59 water will be periodically transferred from the above ground storage tank to the CWTF using a tanker truck.

The CWTF will continue to accept and treat waters from ER Accelerated Action Projects

The process flowpath for the water to be treated is chosen based upon the influent contaminants and best anticipated method of treatment Efforts will be made to minimize waste generation during CWTF operations

SECTION B - OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

6 0 INTRODUCTION, OPERATIONS, AND SAMPLING

The OU7 Passive Seep Interception and Treatment System (PSITS) is designed to collect and treat OU7 seep water and thereby eliminate, to the extent practicable, the discharge of the F039 listed waste contained in this seep water to the East Landfill Pond. The collection and treatment system is comprised of the following items

A seep interception system
A settling basin to remove total suspended solids
A biocide (hydrogen peroxide) addition system
A bag filtration system consisting of two filters operated in parallel (currently 25 micron bags are in use in the system)
One or two 55 gallon drums of granular activated carbon (GAC) to remove volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) When two GAC drums are in use, the drums are operated in series in lead and lag positions

Obtaining and maintaining smooth operation of the OU7 PSITS has been challenging due to the rapid build up of sediments in the filter socks air binding of the system due to the addition of hydrogen peroxide the small system head differential and occasionally increased flow to the system due to storm events and seasonal variations Since mid February 1996 filter socks have required replacement approximately seven times (for a total of approximately 14 removed filter socks) and 4 GAC drums have been removed from service Since the beginning of June 1996 hydrogen peroxide has not been added to the system in an attempt to eliminate the persistent air binding problem.

Highlights of the construction and subsequent operation of the OU7 PSITS are as follows

June 27 1995 CDPHE and EPA approves the Modified OU7 Passive Seep Collection and Treatment PAM dated March 1996
December 6 1995 Construction of the OU7 PSITS began
February 21 1996 OU7 PSITS system shake-down began
February 24 and 25 1996 Settling basin pumped down
February 26 1996 OU7 PSITS by passed due to operational problems (see above)
April 30 1996 OU7 PSITS operational with one GAC drum and two filter socks in use
May 5 1996 Settling basin pumped down to below high-level alarm set-point.
May 8 1996 Air vents added to filters and GAC drums to allow relief of bound air
May 15 1996 Hydrogen peroxide storage tank wrapped with reflective sheet to prevent ultraviolet (UV) rays from degrading the hydrogen peroxide
May 22 1996 Settling basin pumped down
May 26 1996 By pass line installed at 26" below the top of the settling basin to allow for by pass during maintenance activities or during periods of high flow Some water by-passing
May 28 1996 At time of inspection water at approximately 2 gallons per minute was by passing the system Filter socks changed-out and different GAC put on line
June 6 1996 By pass line modified to include a "wet well" for use in measuring settling basin water level
June 13 1996 Tank sump fitting grouted
June 26 1996 Guard rail added around tank vault, and steel lid replaced by a lighter lid

No GAC effluent samples were taken during the first quarter of 1996 One GAC effluent sample was taken during the second quarter of 1996 (5/29/96) The results of this second quarter sample are shown in Table 6 1 Table 6 1 also illustrates that VOCs the indicator compounds which will be used to determine GAC change-out, were less than the RFCA Segment 4a & 4b Standards

Two GAC drums were brought on line July 24 1996 The effectiveness of GAC drum series operation will continue to monitored EPA will be notified in any instance where by pass continues longer than 72 hours

TABLE 6-1
OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM
COMPARISON OF SELECTED OU7 CONSTITUENTS TO RFCA SEGMENT 4a & 4b STANDARDS
JANUARY THROUGH JUNE 1996

Constituents a/	Location Code SW00196 Sample Date 5/29/1996 Sample Number SW70501RG Units (ug/L)		RFCA Segment 4a & 4b (ug/L)	PQLs b/ (ug/L)
VOLATILES				
1,1 Dichloroethane	2		--	1 00
1,2 Dichloroethene	1	U	70.00 (cis)	5 00
2 Butanone (MEK)	4	J	--	--
2 Hexanone (MBK)	5	U	--	--
4-Methyl 2 Pentanone	5	U	--	--
Acetone	22	B	--	--
Benzene	0 3	J	1.00	1 00
Carbon Disulfide	1	U	--	--
Chloroethane	1	U	--	--
Chloromethane	1	U	5.70	--
Ethylbenzene	0 2	J	680 00	10 00
Methylene chloride	2	B	5.00	--
o-Xylene	--		--	--
Tetrachloroethene	1	U	0 80	1 00
Toluene	0 2	J	1,000 00	5 00
Trichloroethene	1	U	2.70	1 00
Vinyl Acetate	--		--	--
Vinyl Chloride	1	U	2.00	2 00
Xylene (total)	2		10,000.00	5 00
TICS	3	J	--	--
SEMI-VOLATILES				
2,4-Dimethylphenol	10	U	540.00	50 00
2-Methylnaphthalene	2	J	--	--
4-Methylphenol	10	U	--	--
Acenapthene	10	U	520.00	10 00
bis(2-ethylhexyl)phthalate	5	J	1 80	6 00
Butylbenzylphthalate	4	J	3,000.00	10 00
Dibenzofuran	10	U	--	
Diethylphthalate	3	BJ	23,000 00	10 00
Di-n butylphthalate	6	J	2 70	10 00
Fluorene	10	U	1,300.00	10 00
Naphthalene	2	J	620 00	10 00
Phenanthrene	10	U	0 0028	10 00
Phenol	5	J	2,560 00	50 00
TICS	500	J	--	--

a/ This list is comprised of the VOC and SVOC constituents found in Appendix A of the Passive Seep Interception and Treatment OU7 Modified PAM dated March 1996 and constituents identified in the 5-29-96 sample

b/ Whenever the practical quantitation limit (PQL) for a pollutant is higher (less stringent) than a standard and/or action level "less than" the PQL shall be used as the compliance threshold These less stringent PQLs are bolded

Selected Laboratory Data Qualifiers and Descriptions

Qualifier	Description
B	< method detection limit but >= instrument detection limit (INORGANIC)
B	Analyte found in blank and sample (ORGANIC)
D	Compound identified using secondary dilution factor (ORGANIC)
E	Concentration exceeds calibration range of instrument (ORGANIC)
E	Estimated due to interference (INORGANIC)
J	Estimated value, < sample s detection limit
N	Spiked recovery not within control limits (INORGANIC)
S	Determined by MSA (INORGANIC)
U	Undetected, analyzed for but not detected
W	Post-digest sample outside of control limit (INORGANIC)

Selected Data Validation Qualifiers and Descriptions

Qualifier	Description
A	Data is acceptable, with qualifications
JA	Estimated, acceptable
R	Data is rejected
V	Data is valid
Y	Analytical results in validation process
Z	Validation was not requested or performed

Appendix A
Data Qualifiers and Descriptions